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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,606	01/11/2001	Frank Joseph Pompei	HOLOS-001XX	9889
207	7590	12/24/2003	EXAMINER	
WEINGARTEN, SCHURGIN, GAGNEBIN & LEBOVICI LLP TEN POST OFFICE SQUARE BOSTON, MA 02109			CHAU, COREY P	
			ART UNIT	PAPER NUMBER
			2644	
DATE MAILED: 12/24/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/758,606	POMPEI, FRANK JOSEPH
Examiner	Art Unit	
Corey P Chau	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-26 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 01/11/01 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 and 3.
- 4) Interview Summary (PTO-413) Paper No(s). _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1 and 12 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 5885129 to Norris.

3. Regarding Claim 1, Norris discloses a toy having a parametric speaker (Fig. 2, reference 42) comprising an ultrasonic frequency generator (i.e. ultrasonic signal source) (Fig. 2, reference 54), a sonic frequency generator (i.e. audio signal source) (Fig. 2, reference 58), modulator (Fig. 2, reference 50), transducers (Fig. 2, reference 70), and means for applying the modulated carrier to the transducer (Fig. 2). The transducers emit a 5kHz sonic compression wave at the target (i.e. acoustic transducer array has a bandwidth of greater than 5 kHz) (column 3, lines 50-65).

4. Regarding Claim 12, Norris discloses a transducer and a modulated carrier signal and it is inherent that the transducer has an area and the modulated carrier signal has an amplitude (Fig. 2, reference 70; Fig. 3). Therefore, using the area and the amplitude to define loudness.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 3, 4, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of ACUSTICA, Vol. 4, 1954, No. 5, "Condenser Transmitters and Microphones with Solid Dielectric for Airborne Ultrasonics" by Kuhl et al (hereafter as Kuhl).

7. Norris discloses all elements of Claim 2 except for a membrane-type transducer. Kuhl discloses a paper published by Sell on capacitive loudspeakers (i.e. sell-type electrostatic transducer), microphone, and pressure-measuring devices with solid dielectrics in 1937 in Germany, suggesting the advantage of back plates with concentric grooves. The published frequency responses show a very high sensitivity with a cutoff frequency of some kc/s. These systems with solid dielectrics can also be used as transmitters. They require only small dc-voltages of the order of 100-300 volts for operation (column 2, lines 1-16). The transmitter consisting of an externally metallised diaphragm of plastic is stretched over the metallic back plate, wherein the black plate is either circular, rectangular, or cylindrical (column 3, paragraph 2). Fig. 1c. show a diaphragm, a metallic layer, a back plate, and a DC voltage. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Norris with the teaching of Kuhl to have a capacitive loudspeaker

as the acoustic transducer to have a high sensitivity with a cutoff frequency of some kc/s and require only small dc-voltages of the order of 100-300 volts for operation.

8. All elements of Claim 3 are comprehended by Claim 2. Claim 3 is rejected for reasons stated above apropos to Claim 2.

9. All elements of Claim 4 are comprehended by Claim 2. Claim 4 is rejected for reasons stated above apropos to Claim 2 (Kuhl Fig. 1c).

10. All elements of Claim 8 are comprehended by Claim 2. Claim 8 is rejected for reasons stated above apropos to Claim 2.

11. All elements of Claim 9 are comprehended by Claim 2. Claim 9 is rejected for reasons stated above apropos to Claim 2.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of ACUSTICA, Vol. 4, 1954, No. 5, "Condenser Transmitters and Microphones with Solid Dielectric for Airborne Ultrasonics" by Kuhl as applied to claim 2, 3, 4, 8 and 9 above, and further in view of U.S. Patent No. 6445804 to Hirayanagi and even more further view of JP 54034662 to Nakamura.

13. Regarding Claim 5, Norris as modified discloses a toy having a parametric speaker, but lacks a driving amplifier. Hirayanagi discloses a speaker system that has an amplifier between an amplitude modulator and an electro-acoustic transducer to amplify the amplitude modulated signal, in order to drive the electro-acoustic transducer (column 7, lines 17-19). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Norris with the

teaching of Hirayanagi to incorporate an amplifier between the modulator and transducers of Hirayanagi to amplify the modulated signal, in order to drive the transducers.

14. Regarding Claim 5, Norris as modified discloses a toy having a parametric speaker, but lacks a blocking capacitor. Nakamura discloses a device to prevent the transient fluctuation for the amplifier which combines a number of signal sources and drives many loads in a carrier device, by securing the earth potential in terms of DC through connection of the DC blocking capacitor or the resistance to the input or output terminal of the amplifier (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching of Nakamura to incorporate a DC blocking capacitor between the amplifier and the transducer to prevent the transient fluctuation for the amplifier.

15. Claims 6, 15, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of ACUSTICA, Vol. 4, 1954, No. 5, "Condenser Transmitters and Microphones with Solid Dielectric for Airborne Ultrasonics" by Kuhl as applied to claim 2, 3, 4, 8 and 9 above, and further in view of U.S. Patent No. 3565209 to Babcock et al (hereafter as Babcock).

16. Norris as modified discloses all element of Claim 6 except for a first component coupled between the acoustic transducer array and the DC bias source and configured to block the amplified signal from the DC bias source. Babcock discloses an apparatus

to generate an acoustic output that contains a choke (i.e. first component) to prevent the output current from an amplifier from flowing through a bias voltage source as part of a process to reduce distortion of a acoustic signal (Fig. 2; Fig. 3; column 2, lines 26-30 and lines 52-72). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching Babcock to incorporate a choke between the acoustic transducer array and the DC bias source to prevent the output current from an amplifier from flowing through a bias voltage source as part of a process to reduce distortion of a acoustic signal.

17. Claim 15 is essentially similar to Claim 1 and Claim 6 and is rejected for the reasons stated above apropos of Claim 1 and Claim 6.

18. Regarding Claim 16, Norris discloses an ultrasonic carrier signal greater than 45kHz (column 3, line 66 to column 4, line 4).

19. Regarding Claim 17, Norris discloses an ultrasonic carrier signal greater than 55kHz (column 3, line 66 to column 4, line 4)..

20. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of ACUSTICA, Vol. 4, 1954, No. 5, "Condenser Transmitters and Microphones with Solid Dielectric for Airborne Ultrasonics" by Kuhl as applied to claim 2, 3, 4, 8 and 9 above, and further in view of U.S. Patent No. 3373251 to Seeler.

21. Norris as modified discloses all elements of Claim 7 except for a DC bias source provided by an embedded charge. Seeler discloses an electrostatic transducer that provides a thin plastic film diaphragm with an electrically conductive surface on the side opposite that in contact with a back plate, which surface may either be polarized in the form of an electret or have a bias voltage applied thereto, to provide a desired electrostatic field between the conductive layer on the diaphragm and the electrically conductive back plate (i.e. DC bias source provided by an embedded charge) (column 2, lines 30-37). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching of Seeler to have the diaphragm of Norris be an electret diaphragm to provide a desired electrostatic field between the conductive layer on the diaphragm and the electrically conductive back plate.

22. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of U.S. Patent No. 4169219 to Beard.

23. Norris discloses all element of Claim 10 expect for a circuit configured to perform nonlinear inversion of the audio signal. Beard discloses one feature of his apparatus wherein generation of the gain control signal is reset at a time in which lags termination of an information signal by a period substantially equal to its delay period. A system can thereby retain the reduced gain as long as required, and achieve rapid transient return to the high level to maintain maximum rejection of channel noise (column 3, lines 32-38). A non-linear circuit receives an output of a level sensing circuit, such as a peak

level detectors, average level detectors, or a root mean square level detectors and the output of the non-linear circuit should be inversely proportional to the square root of its input signal. A delay circuit receives a gain control signal from the nonlinear circuit and outputs a signals to a variable gain amplifier (column 5, lines 18-29; column 6, lines 3-15). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching Beard to incorporate an apparatus with a level sensing circuit, a non-linear circuit, a delay circuit, and a variable gain amplifier (i.e. circuit to perform nonlinear inversion) to receive an input audio source to generate a gain control signal that reset at a time which lags termination of the information signal by a period substantially equal to its delay period. The system can thereby retain the reduced gain as long as required, and achieve rapid transient return to the high level to maintain maximum rejection of channel noise.

24. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of U.S. Patent No. 4991221 to Rush.

25. Regarding Claim 11, Norris as modified discloses all elements of Claim 11 except for a matching filter. Rush discloses use of an electronic crossover utilizing a modified 24-dB/oct design to divide up a signal into frequency bands to be supplied to a tweeter and bass drivers, as well as to compensate for the characteristics of the drivers, in order to provide a flat frequency response curve for the entire speaker (i.e. matching filter) (abstract). Therefore, it would have been obvious to one having ordinary skill in

the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching Rush to incorporate an electronic crossover before the driving amplifier that utilizes a modified 24-dB/oct design to divide up a signal into frequency bands to be supplied to a tweeter and bass drivers, as well as to compensate for the characteristics of the drivers, in order to provide a flat frequency response curve for the entire speaker.

26. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris.

27. Regarding Claim 13, Norris discloses a modulated carrier signal wherein the amplitude varies, therefore it is obvious that it can provide a loudness greater than $(2.0 \times 10^{-4}) \text{ Pa}^2 \times \text{in}^2$ (column 3, lines 45-48; column 6, lines 57-61).

28. Claim 14 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos of Claim 13.

29. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of ACUSTICA, Vol. 4, 1954, No. 5, "Condenser Transmitters and Microphones with Solid Dielectric for Airborne Ultrasonics" by Kuhl as applied to claim 2, 3, 4, 8 and 9 above, and further in view of U.S. Patent No. 3565209 to Babcock et al. and even more further view of U.S. Patent No. 4122725 to Thompson.

30. Regarding Claim 18, Norris as modified discloses all elements of Claim 18 except for a driving amplifier further including a damping resistor coupled between the

inductor and the capacitive load of the acoustic transducer array. Thompson discloses use of an inductor and a damping resistor that are connected electrically across transducers. The inductor resonates with a clamped capacitance of the transducer at a resonant mode frequency of the transducer elements so that a significant amount of driving energy is dissipated in the damping resistor (column 2, lines 52-60). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching of Thompson to incorporate a damping resistor coupled between an inductor and a capacitor to allow the inductor resonates with a clamped capacitance of the transducer at a resonant mode frequency of the transducer elements so that a significant amount of driving energy is dissipated in the damping resistor.

31. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of ACUSTICA, Vol. 4, 1954, No. 5, "Condenser Transmitters and Microphones with Solid Dielectric for Airborne Ultrasonics" by Kuhl as applied to claim 2, 3, 4, 8 and 9 above, and further in view of U.S. Patent No. 3565209 to Babcock et al. and even more further view of U.S. Patent No. 5298828 to Radovanovich.

32. Regarding Claim 19, Norris as modified discloses all elements of Claim 19 except for a step-up transformer. Radovanovich discloses use of a step up transformer associated with the input and output of operational amplifiers, for improving the matching of input and output impedances of operational amplifiers to an electrical

impedance of transducer elements (Claim 4). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching Radovanovich to incorporate a step up transformer after the amplifier to improve the matching of input and output impedances of operational amplifiers to an electrical impedance of transducer elements.

33. Claims 20, 21, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5885129 to Norris in view of ACUSTICA, Vol. 4, 1954, No. 5, "Condenser Transmitters and Microphones with Solid Dielectric for Airborne Ultrasonics" by Kuhl as applied to claim 2, 3, 4, 8 and 9 above, and further in view of U.S. Patent No. 6445804 to Hirayanagi and even more further view of U.S. Patent No. 4005382 to Beaver.

34. Norris as modified discloses all elements of Claim 20 except for a delay circuit. Beaver discloses proper selection of the delay value between adjacent transducer can accomplish preferential ultrasonic reception or transmission in particular directions (abstract). The delay value is given by the expression $Y = (d/c) \sin \theta$, where "d" is the spacing between adjacent transducer elements, "c" is the velocity of the ultrasonic wave in the medium through which it travels, and " θ " is the steering angle (column 3, lines 41-68; column 7, line 62 to column 8, line 48). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the toy having a parametric speaker of Norris with the teaching of Beaver to couple a delay

element (i.e. delay circuit) of Beaver to a transducer to generate a delay value that can accomplish preferential ultrasonic reception or transmission in particular directions.

35. Claim 21 is essentially similar to Claim 20 and is rejected for the reasons stated above apropos of Claim 20.

36. All elements of Claim 22 are comprehended by Claim 20. Claim 22 is rejected for reasons stated above apropos to Claim 20.

37. All elements of Claim 23 are comprehended by Claim 20 and Claim 2. Claim 23 is rejected for reasons stated above apropos to Claim 20 and Claim 2 (Kuhl, column 8, lines 3-22).

38. All elements of Claim 24 are comprehended by Claim 20. Claim 24 is rejected for reasons stated above apropos to Claim 20.

39. Claim 25 is essentially similar to Claim 20, Claim 22, and Claim 23 and is rejected for the reasons stated above apropos of Claim 20, Claim 22, and Claim 23.

40. Claim 26 is essentially similar to Claim 25 and Claim 1 and is rejected for the reasons stated above apropos of Claim 25 and Claim 1.

Conclusion

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P Chau whose telephone number is (703)305-0683. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

December 2, 2003


FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600